



NITRD News Brief

We are pleased to continue NITRD's News Brief that offers insight into the activities NITRD's member agencies are conducting to achieve the Nation's priorities through the lens of the public-facing news sources. These are divided into networking and information technology topics that have been identified as of great importance for improving Americans' daily lives.

For ease of access, under NITRD's logo, the title of each section is listed as a link to that section. The titles of the articles under the section's heading are links that provide immediate access to the news article listed. We hope you find this informative and helpful in your daily activities.

Do you know someone who would like to receive NITRD's weekly news brief? They can email NITRD's IT aficionados at nc@nitrd.gov and voilà they will receive the news brief with the cool technology articles each week!

WOMEN'S HISTORY MONTH: Women in STEM & IT

Readout of White House Roundtable, Women Rebuilding America

...Women working full-time, year-round are paid only 84 cents, on average, for every dollar paid to men. Pay disparities are wider, on average, for many women of color, including Black women, Latinas, Native American women, and some groups of Asian American women. Reducing barriers and opening pathways to good jobs is an important part of closing gender and racial pay gaps. As part of President Biden's Investing in America agenda, the Biden-Harris Administration is making historic investments and creating good-paying jobs in industries such as advanced manufacturing, construction, and clean energy, and is providing opportunities for more women to access those jobs. The White House Women Rebuilding America roundtable convened private employers and unions who support women's access to jobs in the trades to discuss strategies to recruit, train, and hire women, especially women of color. White House officials underscored how women will play a critical role in advancing the progress of the President's Investing in America agenda...

The White House - Mar 14, 2023

A Message from EEOC Chair Charlotte A. Burrows for 2023 Equal Pay Day and Women's History Month

...For over a quarter century, Equal Pay Day has served as a symbolic reminder of a real and persistent problem. The first Equal Pay Day observance on April 11, 1996 represented how far into the year women needed to work—at that time, over four months—in order to be paid what men had made the prior year. While we have gradually chipped away at the gender pay gap, we still have significant work to do. Women who work full time are paid on average only about 84 cents on every dollar paid to white men. And the pay gap is even wider for some women of color, mothers, and LGBTQI+ workers when compared to what white men make. That means we are deep into the calendar year by the time we mark Black Women's Equal Pay Day in July, even deeper into the year for Latinas' Equal Pay Day in October, and deeper still for Native Women's Equal Pay Day in November. Women's individual stories often include the reality that their contributions have been undervalued, underpaid, and overlooked. When women forge a path in higher-paying fields and industries where they are underrepresented, such as in Science, Technology, Engineering, and Mathematics (STEM), construction, or manufacturing, they may face unequal treatment or a hostile work environment. The Institute for Women's Policy Research estimated that a "30-year-old apprentice pushed out of her union apprenticeship into a non-union job in another field faces financial costs of more than a million dollars over her lifetime." This Equal Pay Day and throughout Women's History Month, we recognize the unsung heroes who advance equality every day in ways big and small. They are women like Dr. Kizzmekia S. Corbett, Assistant Professor at Harvard University's T.H. Chan School of Public Health, who led the National Institutes of Health team that developed the Moderna COVID-19 vaccine. In reflecting on women's contributions in STEM fields and her own role as an African American female scientist, she noted: We have a long way to go..."

The U.S. Equal Employment Opportunity Commission - Mar 14, 2023

Military Celebrates Women's History Month

...March is Women's History Month. This year's theme, "Celebrating Women Who Tell Our Stories," acknowledges the pioneering women, past and present, as important contributors to the achievements of the military services and civilian workforce. Women and their stories represent the many untold stories in DOD of women who took on mission-critical assignments and advanced as leaders in the military, research, science, technology, engineering and mathematics. The department celebrates their collective victories which strengthen our workforce. In 1971, women made up just 1% of the military services. Ten years later, it was 8.5% However, women at that time were not allowed to serve in combat military occupational specialties like infantry, artillery and combat aviation. As of Oct. 2022, there were 231,147 women who made up around 18% of the department's active duty force and all jobs have opened to them in recent years. Also, about 33% of DOD civilians are women. The acronym for the Coast Guard Women's Reserve, interestingly, is SPAR, which stands for Semper Paratus - Semper Paratus is Latin for always ready...

U.S. Department of Defense - Mar 10, 2023

NASA's Modern History Makers: Kristen Bury

...When Kristen Bury began her career at NASA's Glenn Research Center in Cleveland, Artemis was a mere set of blueprints. Her focus was Orion — Artemis' spacecraft built to take humans farther than they've ever gone before — and as a systems engineer, she modeled and simulated its power system. More than a decade later, she continues to support Artemis, but now as part of an international team of project managers for the European Service Module (ESM). The NASA team is led out of Glenn and manages the ESM along with the European Space Agency (ESA). Her team ensures that NASA and ESA complete all tasks on time and on budget. She makes sure flight hardware from Europe arrives at NASA's Kennedy Space Center at just the right time to integrate with the rest of the Orion spacecraft. It's fitting that Bury is part of uniting people across the world to advance scientific discovery, build a global alliance, and explore deep space for the benefit of all. After all, she grew up under the influence of "Starfleet," an armada of the United Federation of Planets, known for conducting deep space exploration, research, and diplomacy. After graduating from the University of Toledo with a degree in chemical engineering, Bury dove into her career at NASA Glenn surrounded by world-class experts in their field. After feeling "imposter syndrome" in the beginning, she reminded herself that no one becomes an expert their first day on the job, and that knowledge and skill will come with time...

National Aeronautics and Space Administration - Mar 14, 2023

Women's History Month: Continued Excellence and Strides for the Future

...We recognize and remember influential women who have challenged the status quo, day-in and day-out, past, present, and future. One influential woman has made strides towards excellence in all she does and influences those around her is Staff Sgt. Crystyle Caviness-Jules, a cyber defense operator, who currently works as a project manager for the 17th Communications Squadron. One contribution that women have made that has impacted Caviness the most is the influence and contributions to academia. Women have not just played roles as teachers and educators; women have led academic institutions, advised the President, shaped the future of education by making it accessible to all, and continue to push for better quality of learning. Caviness is one of the special women who has been making strides not only to better herself, but also those around her...

Air Education and Training Command - Mar 9, 2023

Federal Agency Funding Opportunities

Biden-Harris Administration Opens Applications for First Round of \$2.5 Billion Program to Build EV Charging in Communities & Neighborhoods Nationwide

...The Biden-Harris Administration today opened applications for a new multi-billion-dollar program to fund electric vehicle (EV) charging and alternative-fueling infrastructure in communities across the country and along designated highways, interstates, and major roadways. This is a key step towards the President's goals of building a national network of 500,000 public EV charging stations and reducing national greenhouse gas emissions by 50–52% by 2030. The U.S. Department of Transportation's new Charging and Fueling Infrastructure (CFI) Discretionary Grant Program, established by the Bipartisan Infrastructure Law, will provide \$2.5 billion over five years to a wide range of applicants, including cities, counties, local governments, and Tribes. The CFI Discretionary Grant Program builds on the \$5 billion National Electric Vehicle Infrastructure (NEVI) Formula Program, for which FHWA published finalized minimum standards earlier this month. The Community Program will provide \$1.25 billion to strategically deploy publicly accessible EV charging infrastructure, and hydrogen, propane, or natural gas fueling infrastructure in communities. The Corridor Program will provide \$1.25 billion to strategically deploy publicly accessible EV charging infrastructure and hydrogen, propane, and natural gas fueling infrastructure along designated alternative fuel corridors (AFCs). Applications are due by May 30, 2023...

Department of Transportation - Mar 14, 2023

Department of Energy Requests Proposals from Office of Science National Laboratories to Lead the High Performance Data Facility

...The U.S. Department of Energy (DOE) announced a call for proposals to lead the High Performance Data Facility, a project to create a new scientific user facility specializing in advanced infrastructure for data-intensive science. DOE has a need for a dynamic and scalable data management infrastructure capable of coping with the vast data being generated by major user facilities, supercomputer simulations, and artificial intelligence/machine learning tools. The High Performance Data Facility is envisioned as foundational to advancing DOE's IRI and a broad spectrum of data-intensive research as we enter the era of exascale supercomputing. The HPDF will provide a crucial resource to attack fundamental problems in science and engineering that require nimble, shared access to large data sets, increasingly aggregated from multiple sources. A result from the competition is expected in the Summer 2023 timeframe...

Department of Energy - Mar 10, 2023

HPC

Brain-Inspired Computing Can Help Us Create Faster, More Energy-Efficient Devices — If We Win the Race

...The human brain is an amazingly energy-efficient device. In computing terms, it can perform the equivalent of an exaflop — a billion-billion (1 followed by 18 zeros) mathematical operations per second — with just 20 watts of power. In comparison, one of the most powerful supercomputers in the world, the Oak Ridge Frontier, has recently demonstrated exaflop computing. But it needs a million times more power — 20 megawatts — to pull off this feat. Energy efficiency has emerged as the predominant factor keeping us from creating even more powerful computer chips. While ever-smaller electronic components have exponentially increased the computing power of our devices, those gains are slowing down. NIST colleagues are aiming to develop a new type of computer circuit that uses something called “race logic” to solve problems. In race logic, signals race against each other, and the timing between them matters. The winner of the race tells us something about the solution of the problem. During circuit operation, bits regularly flip their values, from 0 to 1 and vice versa and each bit flip consumes energy. Race logic reduces activity by encoding information in the timing of those bit flips on a wire. This approach allows a single bit flip on a wire to encode values larger than 0 or 1, making it an efficient encoding. An additional advantage of race logic is that signals that lose the race by moving through slower routes are stopped, further saving energy. By being in touch with the latest developments in brain science, next-generation computers can benefit from the recently uncovered secrets of biology...

National Institute of Standards and Technology - Mar 15, 2023

Were galaxies different in the early universe? Computations on NSF-supported supercomputer and upcoming 3D map hopefully will lead to the answer

...The Hydrogen Epoch of Reionization Array (HERA) team reports that it has doubled the sensitivity of the array, which was already the most sensitive radio telescope in the world dedicated to exploring this unique period in the history of the universe. The U.S. National Science Foundation funded the construction of the array in part and additional grants for the research. Computations contributing to the discovery were performed on the NSF-supported Bridges-2 system at the Pittsburgh Supercomputing Center, applying services available through the XSEDE project. The data show that the earliest stars, which may have formed around 200 million years after the Big Bang, contained few other elements than hydrogen and helium. That's different than the composition of today's stars, which have a variety of so-called metals. The finding is consistent with the current model of how stars and stellar explosions produced most of the other elements. HERA seeks to detect radiation from the neutral hydrogen that filled the space between early stars and galaxies and determine when that hydrogen became ionized and stopped emitting or absorbing radio waves. When the radio dishes are fully online and calibrated, the team hopes to construct a 3D map of the bubbles of ionized and neutral hydrogen as they evolved from about 200 million to 1 billion years after the Big Bang...

Study Uses NASA's Supercomputers and Finds Ocean Currents May Affect Rotation of Europa's Icy Crust

...NASA scientists have strong evidence that Jupiter's moon Europa has an internal ocean under its icy outer shell – an enormous body of salty water swirling around the moon's rocky interior. New computer modeling suggests the water may actually be pushing the ice shell along, possibly speeding up and slowing down the rotation of the moon's icy shell over time. The new modeling is the first to show that Europa's ocean currents could be contributing to the rotation of its icy shell. A key element of the study involved calculating drag. Using techniques developed to study Earth's ocean, the paper's authors relied on NASA supercomputers to make large-scale models of Europa's ocean. They explored the complexities of how the water circulates, and how heating and cooling affects that movement. In the simulations, the circulation initially moved vertically, but the rotation of the moon as a whole caused the flowing water to veer in a more horizontal direction – in east-west and west-east currents. The researchers, by including drag in their simulations, were able to determine that if the currents are fast enough, there could be adequate drag on the ice above to speed up or slow down the shell's rotation speed...
National Aeronautics and Space Administration - Mar 13, 2023

On the Fly: NASA Researchers Map Air Taxi Maneuvers in Simulator

...In a world that runs on data, computer simulations are among our most powerful tools for investigating any scenario. The same is true for NASA Advanced Air Mobility (AAM) researchers as they plan the future of the national airspace. Together with industry partners, these researchers are delivering the data needed to allow self-flying electric air taxis and drones to execute flight paths as easily as your phone maps your car's route. The simulations also experiment with a new flight path concept NASA research pilots call a deproach, in which a vehicle can fly in multiple directions as it travels to and from its starting point and adapt beyond its designated flight path if it needs to respond to air restrictions...
National Aeronautics and Space Administration - Mar 14, 2023

From atoms to earthquakes to Mars: High-performance computing at INL for modeling and simulation

...At Idaho National Laboratory, computational scientists use INL's supercomputers to perform "virtual experiments" to accomplish research that couldn't be done by conventional means. While supercomputing can't replace traditional experiments, supercomputing is an essential component of all modern scientific discoveries and advancements. From INL's first supercomputer in 1993 to the addition of the Sawtooth supercomputer in 2020, the demand for high-performance computing has only increased. Sawtooth and INL's other supercomputers are flexible enough to tackle a wide range of modeling and simulation challenges and are especially suitable for dynamic and adaptive applications, like those used in nuclear energy research. INL's supercomputers are one of the Nuclear Science User Facilities' 49 partner facilities and its only supercomputers. Sawtooth contains the computing power of about 100,000 processors all dedicated to very large, high-fidelity problems, which means orders of magnitude more processing power and memory when compared to a traditional laptop computer....
Idaho National Laboratory - Mar 13, 2023

DARPA/NIH-supported research finds python-based compiler achieves orders-of-magnitude speedups

...Legions of users flocking daily to the language for its ease of use due in part to its simple and easy-to-learn syntax. This led researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and elsewhere to make a tool to help run Python code more efficiently and effectively while allowing for customization and adaptation to different needs and contexts. The compiler, which is a software tool that translates source code into machine code that can be executed by a computer's processor, lets developers create new domain-specific languages (DSLs) within Python. DSLs are specialized languages tailored to specific tasks that can be much easier to work with than general-purpose programming languages. "We realized that people don't necessarily want to learn a new language, or a new tool, especially those who are nontechnical. So we thought, let's take Python syntax, semantics, and libraries and incorporate them into a new system built from the ground up," says Ariya Shajii. With the team's new system, Codon, the user simply writes Python like they're used to, without having to worry about data types or performance, which we handle automatically — and the result is that their code runs 10 to 100 times faster than regular Python. Codon is already being used commercially in fields like quantitative finance, bioinformatics, and deep learning. The Codon platform also has a parallel backend that lets users write Python code that can be explicitly compiled for GPUs or multiple cores, tasks which have traditionally required low-level programming expertise. Codon can use the same Python implementation and give the same performance you'll get by rewriting in C. Thus, I believe Codon is the easiest path forward for successful Python applications that have hit a limit due to lack of performance. ... The research was supported by the U.S. Defense Advance Research Projects Agency and the U.S. National Institutes of Health.
MIT News - Mar 14, 2023

Artificial Intelligence / Machine Learning

NSF/ US ARFL-supported researchers used machine learning to build faster and more efficient hash functions - a key component of databases.

...Hashing is a core operation in most online databases, like a library catalogue or an e-commerce website. A hash function generates codes that directly determine the location where data would be stored. Traditional hash functions can generate codes randomly, sometimes two pieces of data can be hashed with the same value. This causes collisions — when searching for one item points a user to many pieces of data with the same hash value. Using learned models instead of traditional hash functions could result in half as many collisions. These learned models are created by running a machine-learning algorithm on a dataset to capture specific characteristics. The team's experiments also showed that learned models were often more computationally efficient than perfect hash functions. ... This work was supported by the U.S. National Science Foundation, the U.S. Air Force Research Laboratory, and the U.S. Air Force Artificial Intelligence Accelerator.
MIT News - Mar 13, 2023

Robotics / Autonomous Vehicles

NASA Picks Firefly Aerospace for Robotic Delivery to Far Side of Moon

...To carry multiple payloads to the far side of the Moon including a satellite to orbit that area, NASA has selected Firefly Aerospace of Cedar Park, Texas. The commercial lander will deliver two agency payloads, as well as communication and data relay satellite for lunar orbit, which is an European Space Agency collaboration with NASA. One of these payloads delivered to the lunar surface aims to take advantage of this radio-quiet zone to make low-frequency astrophysics measurements of the cosmos — focusing on a time known as the “Dark Ages,” a cosmic era that began some 370,000 years after the Big Bang and lasted until the first stars and galaxies formed. Since there is no line of sight and no direct communication with Earth from the far side of the Moon. These payloads are: * Lunar Surface Electromagnetics Experiment-Night (LuSEE-Night): A pathfinder to understand the Moon's radio environment and to potentially take a first look at a previously unobserved era in our cosmic history. * Lunar Pathfinder: A communications and data relay satellite that will provide communication services to lunar missions via S-band and UHF links to lunar assets on the surface and in orbit around the Moon and an X-band link to Earth. * User Terminal (UT): This payload will institute a new standard for S-Band Proximity-1 space communication protocol and establish space heritage...
National Aeronautics and Space Administration - Mar 14, 2023

ARTEMIS – UCLA's most advanced humanoid robot – gets ready for action

...Mechanical engineers at the UCLA Samueli School of Engineering have developed a full-sized humanoid robot with first-of-its-kind technology. Named ARTEMIS, for Advanced Robotic Technology for Enhanced Mobility and Improved Stability, the robot is scheduled to travel in July to Bordeaux, France, where it will take part in the soccer competition of the 2023 RoboCup, an international scientific meeting where robots demonstrate capabilities across a range of categories. Standing 4 feet, 8 inches tall and weighing 85 pounds, it's capable of walking on rough and unstable surfaces, as well as running and jumping. ARTEMIS has been clocked walking 2.1 meters per second, which would make it the world's fastest walking humanoid robot and it is also believed to be the first humanoid robot designed in an academic setting that is capable of running, and only the third overall. ARTEMIS' actuators are electrically driven so it makes less noise and operates more efficiently than robots with hydraulic actuators. Support came from an Office of Naval Research grant a UCLA Spark crowdfunding campaign...
UCLA Newsroom - Mar 10, 2023

5G, Wireless Spectrum, Networking & Communications

NASA Scientists Use Satellite Data to Determine Warming Makes Droughts, Extreme Wet Events More Frequent, Intense

...Scientists have predicted that droughts and floods will become more frequent and severe as our planet warms and climate changes, but detecting this on regional and continental scales has proven difficult. Now a new NASA-led study confirms that major droughts and pluvials — periods of excessive precipitation and water storage on land — have indeed been occurring more often. NASA scientists examined 20 years of data from the NASA/German GRACE and GRACE-FO satellites to identify extreme wet and dry events. Floods and droughts account for more than 20% of the economic losses caused by extreme weather events in the U.S. each year. The economic impacts are similar around the world, though the human toll tends to be most devastating in poor neighborhoods and developing nations. The scientists also found that the worldwide intensity of these extreme wet and dry events — a metric that combines extent, duration, and severity — is closely linked to global warming. The idea of climate change can be abstract. A couple of degrees warmer doesn't sound like much, but water cycle impacts are tangible...
National Aeronautics and Space Administration - Mar 13, 2023

Seven Contestants Selected for NTIA, DoD “2023 5G Challenge”

...Seven contestants have been selected to participate in a \$7 million research competition to promote more secure and interoperable wireless network equipment, the U.S. Department of Commerce’s National Telecommunications and Information Administration (NTIA) and the U.S. Department of Defense (DoD) announced. The 2023 5G Challenge, a collaboration between DoD and NTIA’s Institute for Telecommunication Sciences (ITS) aims to accelerate the adoption of open interfaces, interoperable subsystems, secure networks, and modular multi-vendor solutions toward the development of an open 5G ecosystem. The 2023 5G Challenge consists of multiple stages during which contestants are tasked with wrap-around emulation testing, end-to-end integration testing and mobility testing...
National Telecommunications and Information Admini - Mar 9, 2023

Oversight Program Aims to Make Space Domain More Tactically Relevant for Military Planners, Warfighters

...DARPA aims to help military planners keep track of up to 1,000 targets of interest through management of available space domain resources. The goal of the Oversight program is to enable constant custody to maintain tracking of targets of interest for tactical missions. Apogee Research LLC, BAE Systems Information and Electronics Systems Integration Inc., and Systems & Technology Research LLC are developing software architectures for the initial phase of the program. The program will leverage a large body of research about efficiently optimizing resources and apply it to use of future and current satellite assets. Oversight plans to also enable collaboration between satellite and ground-based resources. Newly developed algorithms will attempt to detect changing behaviors and dynamically re-task appropriate satellite sensors to track objects at scale...
DARPA - Mar 16, 2023

Advanced Manufacturing

US Air Force uses 3D printed parts for the C-5M to deliver new capabilities

...Maintainers from the 60th Maintenance Squadron and 349th Aircraft Maintenance Squadron, along with engineering and engineering support contractors from the C-5 System Program Office out of Robins AFB, Georgia, recently finished work to modify an internal part for a C-5M Super Galaxy by incorporating 3D-printed materials. The printed blocks and wedges provide support to an aerodynamic fairing covering a wing splice on the C-5. Fairings are structural elements that help reduce drag on an aircraft. The blocks, which normally provide internal support to the hump panel, were splitting apart, making the aircraft non-mission capable. To get the aircraft fixed as soon as possible, they integrated 3D-printed parts made from Antero 800NA, a new thermoplastic material, into the aircraft repair. the Antero material has shown promising results and the material appears to be impervious to natural elements. The 3D printed Antero seems to be a really solid replacement. Traditionally, spare parts for the C-5M have been expensive and time-consuming to produce, as they required specialized tooling and long lead times. However, the use of 3D printing has allowed for the creation of these parts in a more efficient manner. The integration of 3D printing technology into the maintenance and repair of the C-5M has had a significant impact for the U.S. Air Force...
Air Force Link - Mar 12, 2023

Climate Change / Green Energy & IT

FACT SHEET: President Biden’s Budget Lowers Energy Costs, Combats the Climate Crisis, and Advances Environmental Justice

...In the two years since taking office, the President’s leadership to tackle the climate crisis has boosted U.S. manufacturing and deployment of cost-cutting clean energy technologies, put the United States on a durable path aligned with limiting warming to 1.5 °C, galvanized global action by partners and the private sector, and advanced environmental justice. The Budget builds on this historic progress by advancing clean energy and investing in climate science, strengthening resilience, advancing environmental justice, and doubling down on America’s global climate leadership. The President’s Budget invests a total of \$52.2 billion in discretionary budget authority to tackle the climate crisis, \$10.9 billion more than FY 2023 or an increase of nearly 26 percent...
The White House - Mar 9, 2023

The Importance of Measuring the Fiscal and Economic Costs of Climate Change

...President Biden’s Executive Order on Climate-Related Financial Risk directed the Council of Economic Advisers (CEA) and the Office of Management and Budget (OMB), along with experts across the U.S. Government, to develop methodologies to integrate climate risks into the President’s Budget. Climate risks could affect the Budget and the overall fiscal outlook through a number of pathways, including altering total tax revenue through effects on Gross Domestic Product (GDP) growth, and changing Federal spending to respond to climate impacts, both to ameliorate climate damages and spur the transition to clean energy. To conduct this vital work, the U.S. Government established two interagency working groups. The first group was established to assess the fiscal risk posed by the impacts of climate change through its effects on the

macroeconomy. The second was formed to develop methods and conduct assessments concerning how climate risk directly impacts the cost of Federal programs and to share climate data across the Federal government. In the face of increasing costs associated with the impacts of climate change, the Biden-Harris Administration continues to invest in mitigating climate related risk by taking steps to reduce greenhouse gas (GHG) emissions...

The White House - Mar 14, 2023

Assistant Secretary Cantor Highlights Collaborative Ocean Stewardship at Our Ocean Conference in Panama

...Consistent with the Biden-Harris administration's clean energy goals and America the Beautiful initiative, the Department is implementing investments in coastal and ocean resilience and restoration through the Bipartisan Infrastructure Law and making great advancements to expand offshore wind opportunities. Through the National Ocean Mapping, Exploration, and Characterization (NOMECE) strategy, interagency partners across the administration are advancing our understanding of the U.S. EEZ to advance science, build ocean-related industries, inform ocean use and conservation, and enhance the nation's prosperity and security. The Department's cooperation with the Government of Panama fulfills U.S. environmental commitments under the U.S.-Panama Trade Promotion Agreement and helps advance mutual regional priorities regarding protecting biodiversity and natural resources. The Interior delegation visited the "Parque Natural Metropolitano," where technical experts from the Department collaborated with Panamanian park and non-governmental organization staff to design and install a solar panel system. This renewable energy network consists of 90 solar panels with the capacity to generate up to 22.5kW of energy and includes a mini weather station...

U.S. Department of the Interior - Mar 9, 2023

NASA Awards Advance 3D Printing, Quantum Tech for Climate Research

...New technology is a key to helping NASA advance its long-term exploration goals for the benefit of all. To support its effort, NASA announced it will create two new institutes to develop technology in critical areas for engineering and climate research. Two new Space Technology Research Institutes (STRIs) will leverage teams led by U.S. universities to create multidisciplinary research and technology development programs critical to NASA's future. One of the research institutes will focus on quantum sensing technology in support of climate research. The other will work to improve understanding and help enable rapid certification of metal parts created using advanced manufacturing techniques. The Quantum Pathways Institute is focused on advancing quantum sensing technology for next-generation Earth science applications. Such technology would enable new understanding of our planet and the effects of climate change. Quantum sensors use quantum physics principles to potentially collect more precise data and enable unprecedented science measurements. These sensors could be particularly useful for satellites in orbit around Earth to collect mass change data – a type of measurement that can tell scientists about how ice, oceans, and land water are moving and changing. The Model-based Qualification & Certification of Additive Manufacturing (IMQCAM) aims to improve computer models of 3D-printed – also called additively manufactured – metal parts and expand their utility in spaceflight applications. Detailed computer models, known as digital twins, will allow engineers to understand the parts' capabilities and limitations – such as how much stress the parts can take before breaking. Such models will provide the predictability of part properties based on their processing that is key for certifying the parts for use. The institute will develop digital twins for 3D-printed parts made from spaceflight materials that are commonly used for 3D printing, as well as evaluating and modeling new materials...

National Aeronautics and Space Administration - Mar 16, 2023

DOE/NASA-Funded Scientists Map Changes in Soot Particles Emitted from Wildfires for More Accurate Climate Models

...The U.S. Department of Energy's Brookhaven National Laboratory are measuring properties of the soot particles emitted by wildfires so they can learn how these plumes affect Earth's climate. Correctly modeling the impact of these particles is important. These models base estimates of how fires impact climate on the optical properties of soot particles sampled in the immediate vicinity of a fire. As the new data show, that approach fails to account for changes in soot particles over time. Those changes, the scientists say, can dramatically influence how much sunlight the particles scatter or absorb, how they interact with water, and how likely they are to form clouds—all of which are important to how they ultimately affect Earth's climate. Most climate models assume that all soot particles look like these uniformly coated black carbon cores. But the data collected for this study show that the thickness of the coating material remains relatively constant for only one to two days. Then the level of coating begins decreasing slowly until only about 30 percent of it remains by about day 10 of the particle's lifecycle, which is not captured in today's climate models. ... The research on biomass burn plumes was funded by the DOE Office of Science (BER) and by NASA's Earth Science Division.

Brookhaven Lab - Mar 14, 2023

NSF-Funded Re-Calculated Simulations Show Ocean Surface Tipping Point Could Accelerate Climate Change

...The oceans help to limit global warming by soaking up carbon dioxide emissions. NSF-funded Scientists have discovered that intense warming in the future could lessen that ability, leading to even more severe warming. The researchers developed the first model that demonstrates that changes in rainfall and ocean temperatures will change ocean chemistry at the surface. Chikamoto and co-authors at UT Austin and the University of Colorado analyzed a climate simulation configured to a worst-case emissions scenario and found that the oceans' ability to soak up carbon dioxide would peak by 2100, becoming only half as efficient at absorbing the greenhouse gas by 2300. The decline happens because of a surface layer of low-alkalinity water that emerges during extreme warming and hinders the ability of the oceans to absorb carbon dioxide. Climate simulations had previously shown that the oceans slow their absorption of carbon dioxide over time, but none had considered alkalinity as an explanation. The researchers recalculated pieces

of a 450-year simulation until they hit on alkalinity as a key cause of the slowing. The findings reveal a previously unknown tipping point that if activated would remove an important buffer of climate change severity...

USU News - Mar 14, 2023

Digital Health

FACT SHEET: President Biden's Budget Accelerates Progress Toward the Goal of Ending Cancer as We Know It

...The President's FY 2024 Budget makes strategic investments in the Cancer Moonshot as part of the President's Unity Agenda to deliver new ways to prevent, detect, and treat cancer and to ensure that the tools we have and those we develop along the way equitably reach all Americans. It builds on the strong progress the Cancer Moonshot made last year, with nearly 30 new programs, policies, and resources in five key priority areas: (1) closing the screening gap, (2) understanding and addressing environmental exposure, (3) decreasing the impact of preventable cancers, (4) bringing cutting-edge research through the pipeline to patients and communities, and (5) supporting patients and caregivers...

The White House - Mar 9, 2023

Streamlining Access to SRA COVID-19 Datasets on the Cloud

...Beginning April 2023, SARS-CoV-2 normalized data and source files from the COVID-19 data buckets on Amazon Web Services (AWS) and Google Cloud Platform (GCP) will be moved to the NIH NCBI SRA on AWS registry. The SARS-CoV-2 original format data from AWS and GCP COVID-19 buckets will be removed and make them available in AWS cold storage. If you need these data, you can request them using the Cloud Data Delivery Service (CDDS). To ensure a smooth transition, we want you to have enough time to adjust your scripts and pipelines to minimize disruption to your analyses...

NCBI Insights - Mar 9, 2023

WowzaPalooza – A Post-Health Datapalooza 2023 Health IT Roundup

...Health Datapalooza is part of the "early season" of health conferences and is often a launch point for new products, prize competitions, program announcements, and collaborations. A quick look at the health IT and interoperability actions, updates, and shoutouts that happened this year around Health Datapalooza: * ONC opened the comment period for the Standards Version Advancement Process (SVAP); * CancerX, announced by the White House as part of the Cancer Moonshot, is a public-private partnership developed as a national accelerator to boost innovation in the fight against cancer; * PandemicX, a six-month pilot program, incubated 15 teams of entrepreneurs. The teams' innovative solutions addressed challenge areas related to HHS' priorities with a focus on health equity; * The 2023 Health Equity DataJam, a data-driven sprint and call-to-action for the public to transform HHS data into digital tools, insights, and innovation for real-world impact; * Our colleagues from the VA re-upped their API pledge to advance technology capabilities to better serve Veterans in the community...

Health IT - Mar 9, 2023

US Department of Labor launches online dialogues to gather public ideas, other input on health policies' support for workers' mental health

...The U.S. Department of Labor today announced the launch of a series of online dialogues to gather ideas and other public input on how health policies can support workers' mental health most effectively. The crowdsourcing will focus on four areas of concern for people with mental health conditions, including benefits policies that meet their needs, access to workplace care and supports, the reduction of related social stigmas, disparities faced by people in underserved communities, shortages of behavioral health professionals, and the establishment of state resource systems. Part of the department's ePolicyWorks initiative, the dialogues will remain open until April 3. Input received will inform the next meeting of the Mental Health Matters: National Task Force on Workforce Mental Health Policy...

U.S. Department of Labor - Mar 10, 2023

Use of Telemedicine among Physicians and Development of Telemedicine Apps

...New data show that the percent of physicians that used telemedicine jumped from 15 percent in 2018 and 2019 to 87 percent in 2021, underlining the unprecedented need for telemedicine during this time. Although the majority of physicians used telemedicine for delivering some care in 2021, most patient visits remained in-person. There are significant differences across physician characteristics in their use of telemedicine. Small practices (three physicians or fewer) were 20 percent less likely to use telemedicine than large practices (more than 50 physicians). Practices owned by individual physicians or physician groups were less likely to use telemedicine than those owned by insurance companies or medical centers. Primary care physicians were 17 percent more likely to use telemedicine than surgical specialists. Physicians indicated that patients' challenges with using telemedicine (such as difficulty using and accessing technology) were the most common barriers to their use of telemedicine...

Health IT - Mar 9, 2023

Other IT Related

FACT SHEET: The President's Budget for Fiscal Year 2024

...The President's Budget details a blueprint to build on the progress, deliver on the agenda he laid out in his State of the Union, and finish the job: continuing to grow the economy from the bottom up and middle out by investing in America, lowering costs for families, protecting and strengthening Medicare and Social Security, and reducing the deficit by nearly \$3 trillion over the next decade by making the wealthy and big corporations pay their fair share and cutting wasteful spending on Big Pharma, Big Oil, and other special interests. * The Budget provides \$375 million for the National Institutes of Standards and Technology's (NIST) Industrial Technology Services to support the progress of NIST's existing manufacturing institute, fund a new institute to be launched in 2023, and promote domestic production of institute-developed technologies. * The Budget provides almost \$21 billion in discretionary spending for CHIPS and Science Act-authorized activities. This funding includes \$1.2 billion for the CHIPS and Science Act-authorized Directorate for Technology, Innovation, and Partnerships to help accelerate and translate scientific research into innovations, industries, and jobs, as well as \$300 million for NSF's Regional Innovation Engines program to galvanize use-inspired research, technology translation, and workforce development. * Within DOE's Office of Science, the Budget also supports cutting-edge research in artificial intelligence, quantum information sciences, microelectronics, and isotope production at the national laboratories and universities. * The Budget supports clean energy workforce development and sustainable infrastructure projects across the country...

The White House - Mar 9, 2023

FACT SHEET: President Biden's 2024 Budget Invests in American Science, Technology, and Innovation to Achieve Our Nation's Greatest Aspirations

...President Biden's Budget includes \$210 billion for federal research and development (R&D), the largest ever investment for federal R&D. The Budget strengthens the nation's R&D enterprise, including over \$100 billion for the basic and applied research that has been a hallmark of the American innovation engine and the envy of the world. It also provides support for bold, new approaches and investments that we need to meet the challenges of our times, including at the Advanced Research Projects Agency for Health (ARPA-H), the National Science Foundation (NSF), and the National Institute of Standards and Technology (NIST). * It provides an increase of \$1 billion for ARPA-H, for a total of \$2.5 billion, to drive innovative health research and speed the implementation of breakthroughs that would transform the treatment, prevention, and early detection of cancer and other diseases. * The Budget also includes \$75 million for a new National Center for Advanced Development in Education at the Department of Education to develop and disseminate innovative, cutting-edge practices and educational tools. * The Budget includes \$2 billion at NSF to help maintain America's edge in the industries of tomorrow, including advanced manufacturing, advanced wireless, artificial intelligence, biotechnology, microelectronics and semiconductors, and quantum information science. * The Budget supports U.S. preeminence in developing innovative technologies that accelerate the transition to a clean energy economy by investing more than \$11.3 billion to boost American innovation and reestablish American leadership in clean energy innovation. * The Budget provides \$1.4 billion at NSF to accelerate STEM education and workforce development, and to help ensure the U.S. science and technology workforce reflects the nation as a whole. * The Budget includes \$420 million at NSF to increase: the participation of historically underrepresented communities and women and girls in science and engineering fields; support for curriculum design; research on successful recruitment and retention methods; development of outreach or mentorship programs; fellowships. * The Budget includes \$4.4 billion for the Defense Advanced Projects Research Agency (DARPA) to make pivotal investments in breakthrough technologies for national security...

The White House - Mar 13, 2023

Celebrating 5 Years of the Technology Modernization Fund

...The Technology Modernization Fund (TMF) is an innovative funding model for Federal technology modernization project that has grown and expanded significantly. The TMF's innovative funding model is game-changing in the way that it offers agencies repayment flexibility outside of the traditional budget cycle to tackle urgent IT projects to not only modernize our government and bolster cybersecurity defenses, but advance the Administration's priority of delivering excellent, equitable, and secure Federal services and customer experience—outlined in both the President's Management Agenda and the Executive Order on improving customer experience...

The White House - Mar 14, 2023

Celebrating one year of TIP

...The Directorate for Technology, Innovation and Partnerships, or TIP, the agency's first new directorate in more than 30 years, was charged with the critical mission of advancing U.S. competitiveness through investments that accelerate the development of key technologies and address pressing societal and economic challenges. TIP is meeting this mission through advances in use-inspired research and innovation and the creation of new pathways for people of all backgrounds and perspectives to engage in the current and future science, technology, engineering and mathematics workforce. As we mark the first anniversary of TIP, we want to look back at all that we have accomplished in a brief time, and contemplate how we can build on this foundation in the months ahead. A key focus for TIP has been fostering innovation and technology ecosystems throughout the nation, with the explicit goal of creating opportunities for everyone everywhere. In May, the Regional Innovation Engines, or NSF Engines, program

was launched to drive research and development in critical technology areas, nurture a diverse and inclusive workforce, and foster economic development around important societal challenges across the U.S. TIP also launched the Enabling Partnerships to Increase Innovation Capacity program, designed to build capacity among research institutions in regional innovation ecosystems, with the hope that they will go on to participate in an NSF Engine or similar program...
National Science Foundation - Mar 16, 2023

NRC Authorizes Restart of NIST Research Reactor

...The U.S. Department of Commerce's National Institute of Standards and Technology (NIST) has received authorization from the Nuclear Regulatory Commission (NRC) to restart its research reactor. The NIST Center for Neutron Research reactor has been shut down since Feb. 3, 2021, when a single fuel element overheated and was damaged because it was not securely latched into place. The NIST reactor is used for a broad range of research and operates at far lower power, temperature and pressure conditions than utility reactors that generate electricity. The NRC's extensive review of this incident showed that the public was safe at all times during the event...
National Institute of Standards and Technology - Mar 10, 2023

President Proposes Nearly \$1.8 Billion for USGS Science in FY 2024

...The President's Budget for fiscal year 2024 includes \$1.786 billion for the U.S. Geological Survey, representing an increase of \$288 million over the FY 2023 enacted budget. The budget proposal allows the USGS to continue investing in key science innovations used by land and natural resource managers, emergency management officials, and others who make critical decisions facing our Nation. Targeted investments in high-performance computing capabilities proposed in the FY 2024 budget offer the USGS the potential to advance complex scenario modeling so science information can be delivered in time for critical decisions. A proposed investment in the Advanced Research Computing Environment would allow the USGS to enhance its capabilities to process and analyze data for use in models—including evacuation response scenarios for volcanic eruptions, earthquakes, landslides, and tsunamis. The 2024 budget proposes investments in the Landsat Next program, which will involve a constellation of three smaller satellites that would succeed Landsat 8 and 9 no earlier than November 2030. Landsat Next would increase the frequency of observations, produce better imagery, and more than double the spectral bands of previous Landsat satellites with finer spatial resolution. These improvements would expand spatial imagery capabilities and revisit the equator every six days, collecting an average of 20 times the data of its predecessor, Landsat 9...
USGS - Mar 9, 2023

Statement by the NSF Director on the President's Fiscal Year 2024 Budget

...The U.S. National Science Foundation's Fiscal Year 2024 budget request of \$11.314 billion will fund research and education across all fields of science, technology, engineering and mathematics. This funding will allow NSF to continue implementing the CHIPS and Science Act of 2022, including support for the TIP Directorate, addressing research security requirements, and enhancing broadening participation and workforce development to train the next generation of STEM talent essential for continued U.S. technological competitiveness and global leadership...
National Science Foundation - Mar 9, 2023

STEM / Workforce & IT

Do You Really Want Employees to Stay?

...The factors affecting employee engagement have changed dramatically over the last few years. In consideration of off-site employees returning to the office/work site, baby boomers retiring in growing numbers, and the increasingly younger workforce, I was interested in exploring what the key drivers of employee engagement are today. The Baldrige Program's 2023-2024 Baldrige Excellence Framework® defines workforce engagement as "the extent of workforce members' emotional and intellectual commitment to accomplishing your organization's work, mission, and vision." Furthermore, "workforce members feel engaged when they find personal meaning and motivation in their work and receive interpersonal and workplace support." ...
National Institute of Standards and Technology - Mar 14, 2023

Deputy Secretary of Defense Signs 2023-2027 DoD Cyber Workforce Strategy

...On February 27, 2023, Deputy Secretary of Defense Dr. Kathleen Hicks signed the 2023-2027 DoD Cyber Workforce (CWF) Strategy, which sets the foundation for how the DoD will foster a cyber workforce capable of executing the Department's complex and varied cyber missions. The strategy will enable the DoD to close workforce development gaps, resource workforce management and development initiatives, stay at the forefront of technological advances, securely and rapidly deliver resilient systems, and transform into a data-centric enterprise with optimized workforce analytics. The DoD is aligning strategic efforts to four human capital pillars: identification, recruitment, development, and retention. These pillars provide the foundation and set unified direction to accomplish the goals outlined in the CWF Strategy. These goals are to execute consistent capability

assessment and analysis processes to stay ahead of force needs; establish an enterprise-wide talent management program to better align force capabilities with current and future requirements; facilitate a cultural shift to optimize Department-wide personnel management activities; and foster collaboration and partnerships to enhance capability development, operational effectiveness, and career-broadening experience...

U.S. Department of Defense - Mar 9, 2023

NASA Selects 21 New Learning Projects to Engage Students in STEM

...NASA is awarding more than \$3.8 million to 21 museums, science centers, and other informal education institutions for projects designed to bring the excitement of space science to communities across the nation and broaden student participation in STEM. Projects were selected for NASA's Teams Engaging Affiliated Museums and Informal Institutions (TEAM II) program and TEAM II Community Anchor Awards. Both are funded through NASA's Next Generation STEM (Next Gen STEM), which supports kindergarten to 12-grade students, caregivers, and formal and informal educators in engaging the Artemis Generation in the agency's missions and discoveries...

National Aeronautics and Space Administration - Mar 16, 2023

NASA Names University Teams to Take on Aeronautics Research Challenges

...NASA has selected four teams of university faculty and students to solve key challenges facing the future of air travel as part of the agency's University Leadership Initiative. This initiative gives the academic community an opportunity to support NASA's aeronautical research goals and provide students experience in cracking real-world technical challenges. Three of the four teams will address topics related to ensuring the safe growth of Advanced Air Mobility, while the fourth will examine an option for generating electricity to propel a future airliner. As the teams work on their projects, they will work with other universities and industry partners – creating opportunities for participation that include students with diverse experiences, backgrounds, and talents...

National Aeronautics and Space Administration - Mar 10, 2023

STEM / Workforce Resources & Opportunities

R&D WORKFORCE TRAINING: FEDERAL AGENCIES' STEM INTERNSHIPS, SCHOLARSHIPS, AND TRAINING OPPORTUNITIES

...Increasing the availability of STEM opportunities is a priority in the Biden-Harris Administration. To help facilitate this, the team at NITRD developed a STEM Portal that allows anyone to search for internships and other training opportunities at Federal agencies. The NITRD STEM PORTAL is a searchable database that includes a description, link, and contact information for each program listing. Government-sponsored internships and training programs are competitive, but there are many Federal opportunities and the NITRD STEM Portal is here to help..

The Networking and Information Technology Research and Development (NITRD) Program - Mar 9, 2023

Federal Register: Request for Information (RFI) / Request for Comment

NTIA seeks feedback on future airwaves for innovative technologies

...NTIA's National Spectrum Strategy Request for Comment seeks input on creating a spectrum pipeline for the next decade of frequencies that could be studied for new or additional uses. The agency's goal is to identify at least 1,500 megahertz of spectrum to study for potential repurposing – perhaps the most ambitious study goal for NTIA to date – to meet future requirements for non-federal and federal users. Developing a strategy to increase access to this finite resource will help ensure continued U.S. leadership in emerging technologies, advance connectivity and competition, create jobs and produce improvements to overall quality of life. Listening sessions will be held March 30 in Washington, D.C. and April 11 at the University of Notre Dame, hosted by SpectrumX – an NSF Center for Spectrum Innovation. Both sessions will also be available via webcast. Comments will be due 30 days from publication in the Federal Register...

National Telecommunications and Information Admini - Mar 15, 2023

Upcoming Conferences / Workshops / Webinars

DARPA's Imagining Practical Applications for a Quantum Tomorrow (IMPAQT) Webinar: Apr 11

...The Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) is sponsoring a live webinar to provide information and promote technical exchange with potential proposers on the objectives of the Imagining Practical Applications for a Quantum Tomorrow (IMPAQT) Advanced Research Concept (ARC) Opportunity (DARPA-EA-23-01-01). The webinar will include an IMPAQT-specific presentation and overview of DSO and the ARC initiative. Registrants will have the opportunity to hear from government personnel, university professors, industry leading quantum hardware providers, and participate in the live question and answer sessions. The webinar will be held virtually on Tuesday, April 11, 2023. Registration closes Friday, April 7, 2023 at 12:00 PM EDT.
DARPA - Mar 13, 2023

Note: Any mention in the text of commercial, non-profit, academic partners, or their products, or references is for information only; it does not imply endorsement or recommendation by any U.S. Government agency.

Innovation Through NITRD Coordination

Networking and Information Technology Research and Development - National Coordination Office, Washington, DC USA

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